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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/665,581	09/18/2000	Erlend Olson	1875.0160000/RES/JTH	4718

7590 06/24/2003
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EXAMINER

NGUYEN, DUC M

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 06/24/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/665,581

Applicant(s)
Olson

Examiner
Duc Nguyen

Art Unit
2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 22-26, and 31-55 is/are rejected.
- 7) ☒ Claim(s) 14-21 and 27-30 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 5 6) ☐ Other:

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DETAILED ACTION

Information Disclosure Statement

1. The references listed in the information disclosure statements submitted on 3/22/02 has been considered by the examiner (see attached PTO-1449).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 23-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 23 recites the limitation "said RF input signal" in the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 1-2, 4, 5, 10-11, 22, 25, 45-47, 53-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Tzuang et al (US Pat. Number 5,930,696).

Regarding claims 1, 25, Tzuang discloses a tunable device comprising :

- a preselect filter that receives a plurality of channels (see Fig. 4B, ref. 15 and col. 6, line 11 - col. 8, line 5) ;

- a LO and an image reject mixer for down converting to lower IF frequencies which are determined by the LO signal (see Fig. 4B, refs. 8, 11 and col. 6, line 11 - col. 8, line 5).

- an IF filter as claimed (see Fig. 4B, ref. 13 and col. 6, line 11 - col. 8, line 5).

Regarding claims 2, 4, 5, 10-11, 22, the claims are rejected for the same reason as set forth in

claim 1 above. In addition, Tzuang discloses

- the selected channel is changed based on the frequency of the LO signal (see col. 6, lines 23-41).

- undesired image ($f_c + f_{LO}$) is suppressed by the image reject mixer (inherently feature);
- the image reject mixer with quadrature as claimed (see Fig. 4B);
- an amplifier with calibration based on the selected channel as claimed (see Fig. 4B and col. 6, lines 42-62).

Regarding claims 45-47, 53-55, the claims are interpreted and rejected for the same reason as set forth in claim 2 above.

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7. Claims **31-32, 38-40, 53-55** are rejected under 35 U.S.C. 102(b) as being anticipated by **Loper** (EP Pub. No. **0473373 A2**).

Regarding claims **31-32**, **Loper** discloses a method for calibrating a tuner, comprising :

- generating a test signal having a selected frequency channel (see Fig. 2, and col. 3, line 44 - col. 4, line 41);
- injecting the test signal to the tuner (see col. 3, line 44 - col. 4, line 41) ;
- determining an I/Q balance of one or more component of the tuner based on the test signal (see col. 3, line 44 - col. 4, line 41);
- adjusting parameters (phase shift) of the component as claimed (see col. 3, line 44 - col. 4, line 41).
- repeating the above process after a time delay (read on the re-calibration process, see col. 4, lines 40-41).

Regarding claims **38-40**, it is clear that **Loper** discloses the step of determining and adjusting the I/Q balance of the LO to improve the I/Q balance of the mixer.

Regarding claims **53-55**, the claims are interpreted and rejected for the same reason as set forth in claim **31** above.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-12, 23-24, 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable by **Loper** in view of **Wheelwright et al** (US Pat No. 4,858,159).

Regarding claims 1, 25, **Loper** discloses a tunable device comprising :

- a preselect filter that receives a plurality of channels (see Fig. 2, and col. 3, lines 51-52);
- a LO as claimed (see Fig. 2, ref. 60);
- an IF filter as claimed (see Fig. 2, refs. 70, 72)
- an image reject mixer as claimed (see col. 3, line 44 - col. 4, line 41);

Here, although Fig. 2 does not show a preselector, it would have been obvious to one skill in the art that the comb generator signal is generated by the synthesizer (which comprises an LO) for selecting a channel which is determined by a frequency of the LO from the synthesizer, which is known as “automatically tuned swept receiver” as disclosed by **Wheelwright** (see Fig. 1 and col. 1, lines 13-53). Therefore, the claimed limitations are made obvious by **Loper** and **Wheelwright** for providing a tuner as claimed, in order to obtain a fix IF frequency of the down converted signal in the IF filter.

Regarding claim 2, the claim is rejected for the same reason as set forth in

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claim 1 above. In addition, it is clear that **Loper** would disclose the selected channel is changed based on the frequency of the LO signal (see **Wheelwright**, col. 1, lines 31-53).

Regarding claim 3, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since fabricating the tuner on a single silicon substrate is known in the art, it would have been obvious to one skill in the art to modify teachings of **Wheelwright** and **Loper** to fabricate the tuner on a single silicon substrate as claimed, for providing a light weight, low cost receiver or tuner.

Regarding claim 4, the claim is rejected for the same reason as set forth in claim 1 above. In addition, it is clear that **Loper** would disclose the undesired image frequency ($f_C + f_{LO}$) is suppressed by the image reject mixer (inherently feature).

Regarding claim 5, the claim is rejected for the same reason as set forth in claim 1 above. In addition, it is clear that **Loper** would disclose the image reject mixer with quadrature LO as claimed (Fig. 2).

Regarding claim 6, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a poly-filter is well known in the art, it would have been obvious to one skill in the art to modify teachings of **Wheelwright** and **Loper** to use an IF poly-filter as claimed, for utilizing advantages provided by the poly-phase filter such as low cost, or functioning as an image rejection filter and a channel selectivity filter as well.

Regarding claim 7, the claim is rejected for the same reason as set forth in

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claim 1 above. In addition, it is clear that **Loper** would disclose a signal processing module as claimed (see Fig. 2, refs. 90, 92).

Regarding claim 8, the claim is rejected for the same reason as set forth in claim 1 above. In addition, it would have been obvious to one skill in the art to independently calibrate the pre-selector as disclosed by **Wheelwright** (see col. 2, lines 6-25), for improving calibration accuracy.

Regarding claim 9, the claim is rejected for the same reason as set forth in claim 1 above. In addition, it is clear that **Loper** would disclose the mixer is calibrated (I-Q balance calibration) on the selected channel (see col. 4, line 23 - col. 5, line 12).

Regarding claim 10, the claim is rejected for the same reason as set forth in claim 1 above. In addition, it would have been obvious that **Loper** as modified would disclose an amplifier as claimed (see Fig. 1, col. 3, lines 51-52), for amplifying a test or calibration signal before testing.

Regarding claim 11, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since calibrating or tuning an amplifier is well known in art, it would have been obvious to one skill in the art to modify **Wheelwright** and **Loper** for calibrating or tuning an amplifier as claimed, for improving calibration accuracy at the output of the mixer.

Regarding claim 12, **Loper** as modified would disclose all the claimed limitations except for a test path with inputs as claimed. However, it is noted that during the manufacturing process for fabricating a receiver, it would have been obvious that the output of each of components of

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the receiver should be measured and tested in order to detect any faulty while ensuring a high quality product as well. By doing so, it would have been obvious that contactor pins could be used for connecting to the output of the pre-selector filter or the amplifier, and connecting to a signal analyzer as claimed, in order to trouble shoot the output data of these component for determining whether these outputs are comply with their specifications. Therefore, the claimed limitations are made obvious by **Loper** and **Wheelwright** for providing a test path as claimed, in order to trouble shoot the output data of each of the components of a receiver.

Regarding claims **23-24**, **Loper** as modified would disclose all the claimed limitations (see claim 1) except for an AFC for adjusting a frequency of the LO to track frequency drift of the input signal. However, since such the above feature is well known in art in order to compensate for frequency drift caused either by an aging LO or by signal sources. Therefore, it would have been obvious to one skill in the art to modify **Wheelwright** and **Loper** for utilizing an AFC to track frequency drifts in order to compensate frequency drift of the input signal as claimed, for improving signal recovery in the demodulation process.

Regarding claims **45-47**, the claims are interpreted and rejected for the same reason as set forth in claim 1 above.

10. Claims **12-13**, **26** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Tzuang et al** (US Pat. No. **5,930,696**) in view of **Koda et al** (US Pat. No. **6,233,442**).

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Regarding claims **26**, **Tzuang** discloses all the claimed limitations (see Fig. 4 B) except for a test path with inputs as claimed. However, it is noted that during the manufacturing process for fabricating a receiver, it would have been obvious that the output of each of components of the receiver should be measured and tested in order to detect any faulty while ensuring a high quality product as well. By doing so, it would have been obvious to one skill in the art to use contactor pins for connecting to the output of the pre-selector filter or the amplifier, in order to trouble shoot the output data of these component for determining whether these outputs are comply with their specifications, or by utilizing electronic switches as disclosed by **Koda** (see Fig. 6 and col. 7, lines 15-29), for trouble shooting these components while reducing adjusting errors, thereby bypassing the image reject mixer.

Regarding claims **12-13**, the claims are and rejected for the same reason as set forth in claim **26** above. In addition, it would have been obvious to use a signal analyzer as claimed, in order to read out and record the output data.

11. Claims **34-37**, **41-44**, **48-52** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Loper** in view of **Mang et al** (US Pat. No. **5,692,279**).

Regarding claims **34-35**, **Mang** discloses a receiver which utilizes a half-lattice filter and a differential amplifier for improving on intermodulation components (see Fig. 9, col. 6, lines 13-56). However, **Mang** fails to disclose the injection of a test signal for calibrating the receiver. However, **Loper** discloses a receiver wherein a test signal is injected for calibrating the I-Q

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channels of the receiver (see Fig. 2 and col. 3, line 44 - col. 4, line 41). Therefore, it would have been obvious to one skill in the art at the time the invention was made to provide the above teaching of **Loper** to **Mang** for utilizing a test signal to calibrate the I-Q channels of the receiver, for improving the performance of the receiver. Here, since the receiver in **Mang** has I-Q channels at the output of the half-lattice filter, hence, when injecting a test signal for calibrating the I-Q channels of the receiver, it would have been obvious that the I-Q channels of the filter would be measured and calibrated as well, for improving the distortion of the receiver.

Regarding claims **36-37**, the claimed are rejected for the same reason as set forth in claim **34** above, whereas when injecting a test signal for calibrating the I-Q channels of the receiver, it would have been obvious that the I-Q channels of the differential amplifier would also be measured and calibrated as well, for improving the distortion of the receiver.

Regarding claims **41-44**, the claimed are rejected for the same reason as set forth in claim **34** above, whereas when injecting a test signal for calibrating the I-Q channels of the receiver, it would have been obvious that the I-Q channels of the filter as well as the differential amplifier and the mixer would also be measured and calibrated, for improving the distortion of the receiver and its performance.

Regarding claims **48-52**, the claims are interpreted and rejected for the same reason as set forth in claims **41-44** above.

Allowable Subject Matter

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12. Claims 14-21, 27-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claims 14, 27, the cited prior art of record fail to disclose or make it obvious an apparatus or method calibrating a tuner which comprises steps and components as specified in the claims, wherein a test signal is injected to the pre-selected filter with a test path having inputs coupled to the pre-selected filter and the amplifier, and with an output coupled to a signal analyzer as specified in the claims.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- **Magin et al** (US Patent Number 5,390,348), System for tracking and correcting drift and dispersion in satellite transmission signal.

- **Lisle et al** (US Patent Number 4,368,468), Monopulse radio receiver compensation apparatus.

- **Johnson** (US Patent Number 4,031,469), Receiver gain calibration.

- **Loke** (US Pat. Number 6,484,042), Secondary automatic gain control loops for direct conversion CDMA receivers.

- **Najle** (US Pat. Number 5,337,014), Phase noise measurements utilizing a frequency down conversion/multiplier, direct spectrum measurement technique.

- **Sues** (US Pat. Number 3,641,515), Spectrum analyzer.

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- **Lindenmeier et al** (US Pat. Number 6,011,962), Circuit for testing the function of mobile receiving installations.

- **Sempel et al** (US Pat. Number 5,408,196), Tunable device.

14. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for formal communications intended for entry)

(for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington VA, Sixth Floor (Receptionist).

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (703) 306-4531, Monday-Thursday (9:00 AM - 5:00 PM). Or to Edward Urban (Supervisor) whose telephone number is (703) 305-4385.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Duc M. Nguyen



June 18, 2003